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टूल्स के शेंक के स्वचलित बदलाव के लिए 7/24 टेपर — स्पिंडल नोज के लिए टेपर

Indian Standard

7/24 TAPERS FOR TOOL SHANKS FOR AUTOMATIC CHANGING — TAPERS FOR SPINDLE NOSES

ICS 621.9.022-229.2

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

September 2002

Price Group 2

NATIONAL FOREWORD

This Indian Standard which is identical with ISO 9270 : 1992 '7/24 Tapers for tool shanks for automatic changing – Tapers for spindle noses' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendations of Machine Tool Elements and Holding Devices Sectional Committee and approval of the Basic and Production Engineering Division Council.

The text of the ISO Standard has been approved as suitable for publication as Indian Standard without deviations. In this adopted standard, certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Comma (,) has been used as a decimal marker in the International Standard while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

b) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

In this adopted standard, reference appears to the following International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their place are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 898-1 : 1988[1] Mechanical properties of fasteners – Part 1 : Bolts, screws and studs	IS 1367 (Part 3) : 1991[2] Technical supply conditions for threaded steel fasteners : Part 3 Mechanical properties and test methods for bolts, screws and studs with full loadabilities (*third revision*)	Identical
ISO 1947 : 1973 System of cone tolerances for conical workpieces from C = 1 : 3 to 1 : 500 and lengths from 6 to 630 mm	IS 7615 : 1993 System of cone tolerances for conical workpieces from C = 1 : 3 to 1 : 500 and lengths from 6 to 630 mm	do
ISO 4762 : 1989 Hexagon socket head cap screws – Product grade A	IS 2269 : 1995 Fasteners – Hexagon socket head cap screws (*third revision*)	Technically equivalent
ISO 7388-1 : 1983 Tool shanks with 7/24 taper for automatic tool changers – Part 1 : Shanks Nos. 40, 45 and 50 – Dimensions Add-1 Conicity tolerances	IS 11173 (Part 1) : 1985 Recommendations for tool shanks 7/24 taper for numerically controlled machine tools with automatic tool changers (tools rotating type) : Part 1 Tool shanks	do

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[1] Since revised in 1999.

[2] Under revision.

(*Continued on third cover*)

Indian Standard

7/24 TAPERS FOR TOOL SHANKS FOR AUTOMATIC CHANGING — TAPERS FOR SPINDLE NOSES

1 Scope

This International Standard specifies the dimensions and tolerances of tenons and 7/24 tapers for machine-tool spindle noses for automatic changing, intended for use with the corresponding tool shanks specified in ISO 7388-1 and ISO 7388-3.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 297:1988, *7/24 tapers for tool shanks for manual changing.*

ISO 898-1:1988, *Mechanical properties of fasteners — Part 1: Bolts, screws and studs.*

ISO 1947:1973, *System of cone tolerances for conical workpieces from C = 1:3 to 1:500 and lengths from 6 to 630 mm.*

ISO 4762:1989, *Hexagon socket head cap screws — Product grade A.*

ISO 7388-1:1983, *Tool shanks with 7/24 taper for automatic tool changers — Part 1: Shanks Nos. 40, 45 and 50 — Dimensions.*

ISO 7388-3:—[1], *Tool shanks with 7/24 taper for automatic tool changers — Part 3: Retention knobs for shank No. 30 — Dimensions, conicity tolerances and mechanical characteristics.*

ISO 9524:1992[1], *Machine tools — Front faces of spindle holders for machining centres — Functional dimensions.*

3 Dimensions

See figure 1 and table 1.

4 Conicity tolerances

The conicity tolerances shall conform with the cone angle tolerance grade AT4 specified in ISO 1947.

These values shall be negative.

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1) To be published.

Perpendicularity, parallelism and symmetry tolerances in millimetres

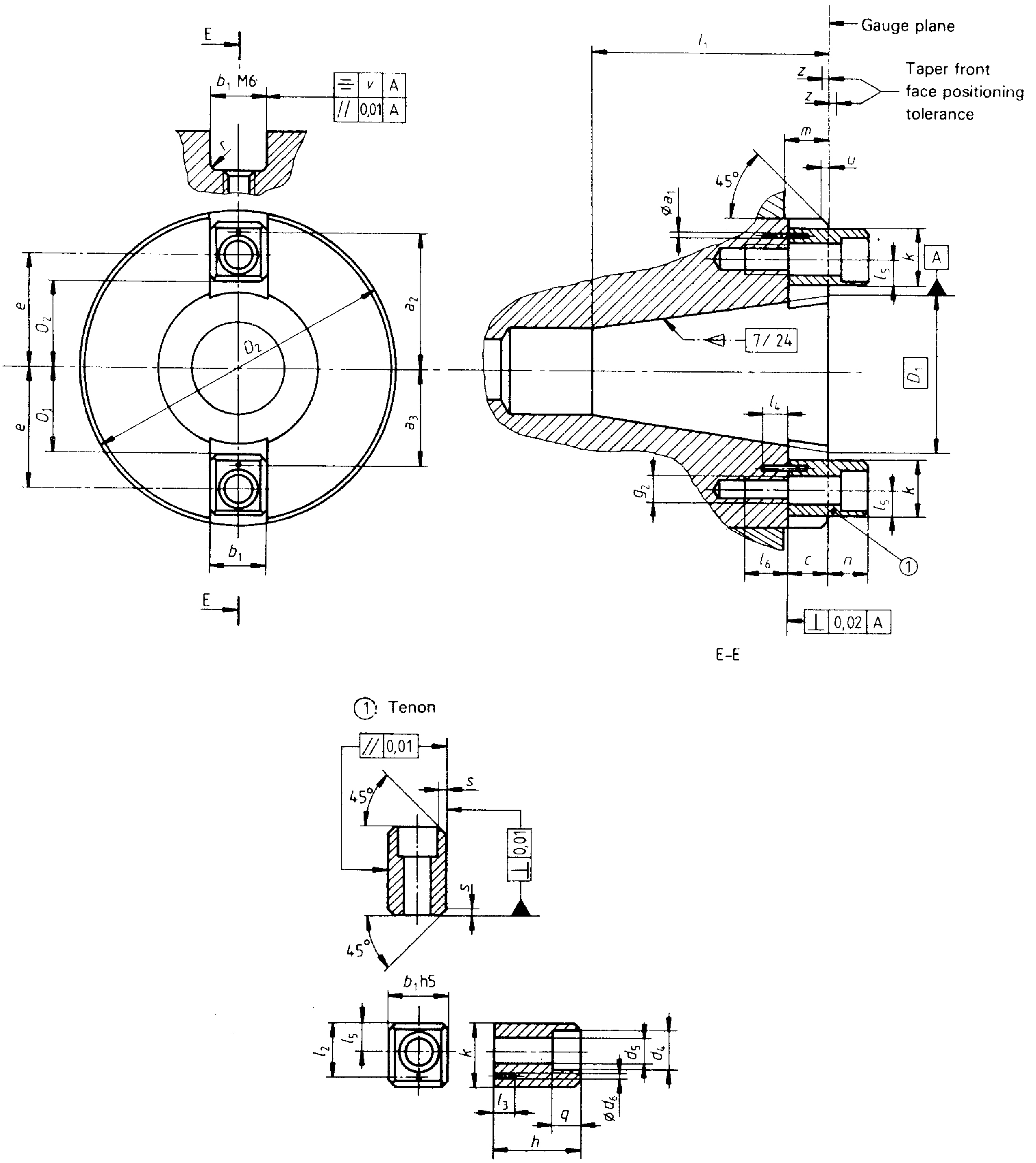

Figure 1

Table 1

Dimensions in millimetres

Designation No.	Taper			1), 2)			Tenon slot								
	D_1 3)	z	l_1	D_2	m min.	u	b_1 4)	v	c min.	O_1	O_2	e ± 0,2	g_2	l_4	l_8
30	31,75	0,2	47,4		12,5	2	15,9	0,06	8	17	19,5	25	M6	7	9
40	44,45	0,2	64,4		16	2	15,9	0,06	8	23,5	26	33	M6	7	9
45	57,15	0,2	81,8		18	2	19	0,06	9,5	30	32,5	40	M8	7	12
50	69,85	0,2	100,8		19	2	25,4	0,08	12,5	36,5	38,5	49,5	M12	7	18

1) When cutter mounting on the spindle is required, the tolerance on D_2 should be h5. For mounting dimensions, D_2, m and u, see ISO 297.

2) When connecting blocks in accordance with ISO 9524 are used, the maximum values for D_2 shall be 100 for taper shank No. 40 and 130 for taper shanks Nos. 45 and 50.

3) D_1 is the basic diameter contained in the gauge plane.

4) b_1 is the dimension of the tenon assembly in the slot: fit, M6-h5.

Designation No.	**Tenon slot** (continued)				**Tenon**1)											
	r max.	a_1 2)	a_2	a_3	n max.	k max.	h $^{0}_{0,2}$	d_4	d_5	d_6	q	s min.	l_2	l_3	l_5 ± 0,1	Fixing screw 3)
30	1,6	2,5	30,6	19,4	16,5	13,5	24,5	10,4	6,4	2,6	6,2	1,6	11,1	4	5,5	M6 × 25
40	1,6	2,5	39,35	26,65	16,5	16,5	24,5	10,4	6,4	2,6	6,2	1,6	13,35	4	7	M6 × 25
45	1,6	2,5	47,1	32,9	16,5	17,5	26	13,4	8,4	2,6	10	1,6	14,6	4	7,5	M8 × 25
50	2	2,5	59,25	39,75	16,5	24	29	19	13	2,6	12,3	2	20,75	4	11	M12 × 30

1) Tenon hardness (58 ± 2) HRC.

2) Stop pins of diameter a_1, and dimensions a_2, a_3, l_2, l_3, l_4 and d_6, are optional.

3) Screws conform with both ISO 4762 and ISO 898-1, class 8.8.

Annex A
(informative)

Bibliography

[1] ISO 7388-2:1984, *Tool shanks with 7/24 taper for automatic tool changers — Part 2: Retention knobs for shanks Nos. 40, 45 and 50 — Dimensions and mechanical characteristics.*

(*Continued from second cover*)

At present there is no Indian Standard on subject covered under following ISO Standards. The technical committee responsible for the preparation of these standards has reviewed the provisions of these ISO Standards and decided that they are acceptable for use in conjunction with this standard:

ISO 297 : 1988	7/24 tapers for tool shanks for manual changing
ISO 7388-3[1]	Tool shanks with 7/24 taper for automatic tool changers – Part 3: Retention knobs for shank No. 30 – Dimensions, conicity tolerances and mechanical characteristics
ISO 9524 : 1992	Machine tools – Front faces of spindle holders for machining centres – Functional dimensions

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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[1] To be published.

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This Indian Standard has been developed from Doc : No. BP 02 (0278).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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